

Altair

Subject:

7th Combined Science

Class: Reproduction

Date: April 29

2011



Teacher's notes

Objectives

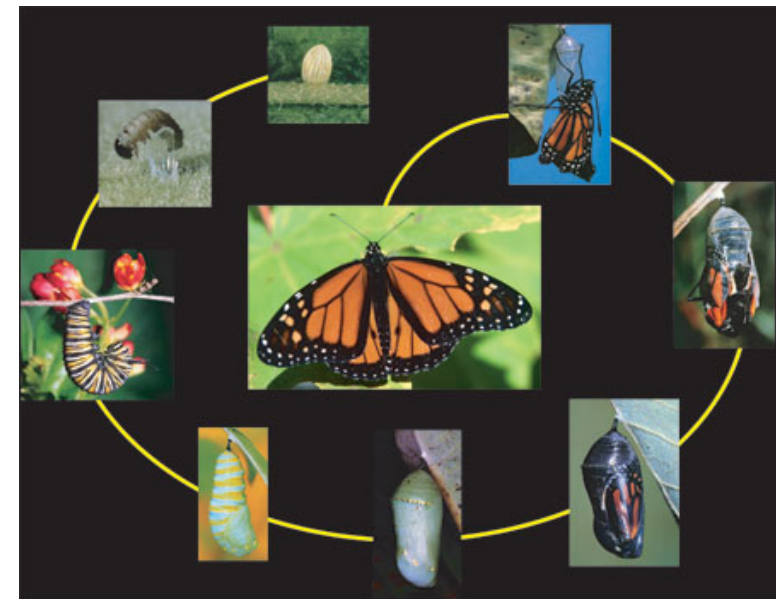
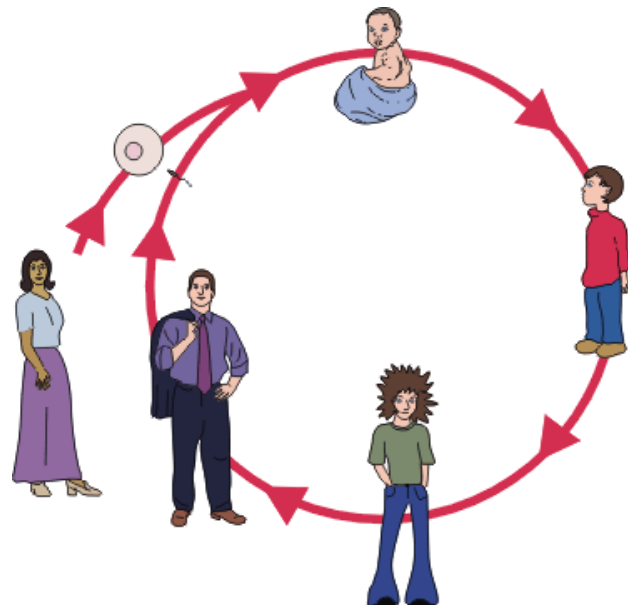
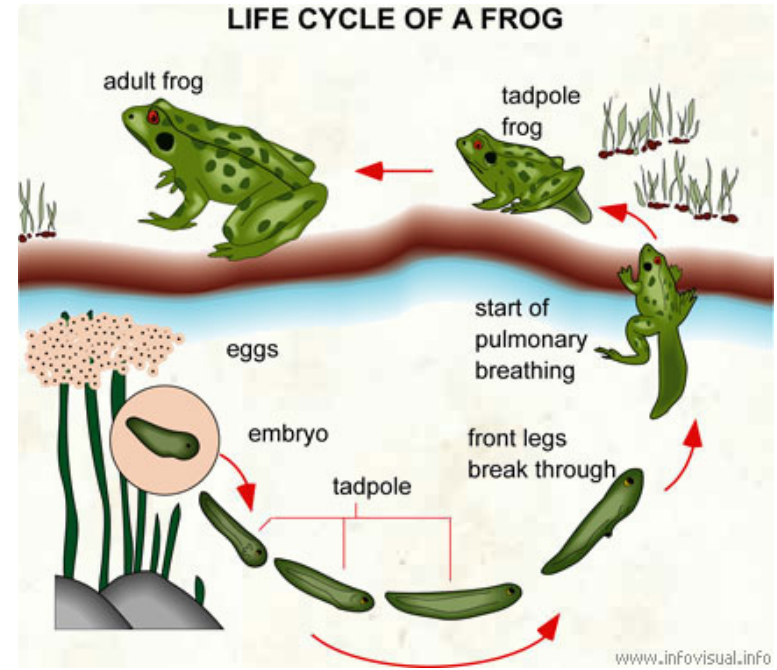
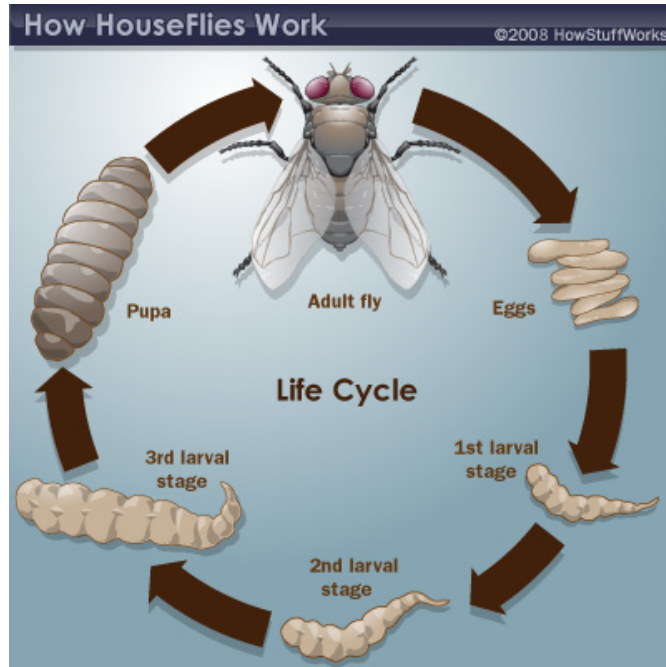
Vocabulary

Link and Learn

Prepared by

Life Cycle

- All living organisms go through stages in their lives. Example of stages: birth and dead.
- In between these two stages many or few changes happen.
- The process happens again in the next generation, and so on.
- A *life cycle* describes all the stages in a living organism's development from one generation to the next.



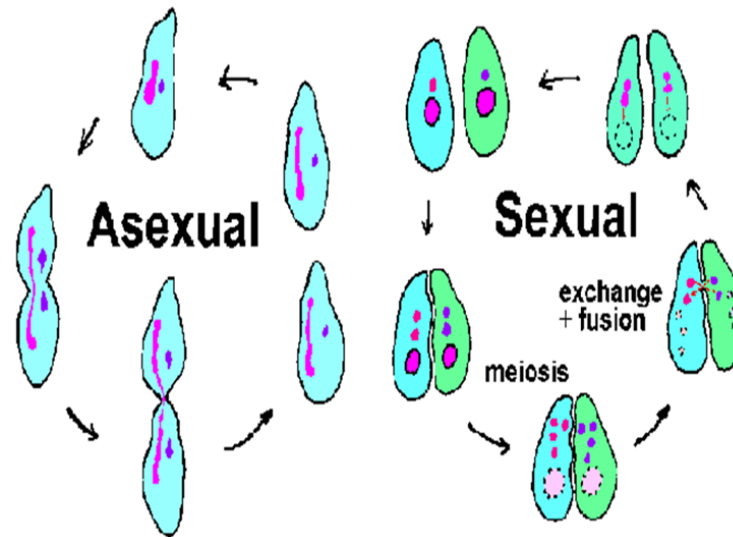
Growth and Development

- After birth, humans go through infancy and childhood, followed by adolescence and finally, adulthood.
- Many other kinds of animals develop into completely different forms as they grow through their life cycle, this is called *metamorphosis*.
- Examples: *tadpoles* develop legs and lungs while becoming frogs; *butterfly larvae* form a cocoon, from where a butterfly arises.



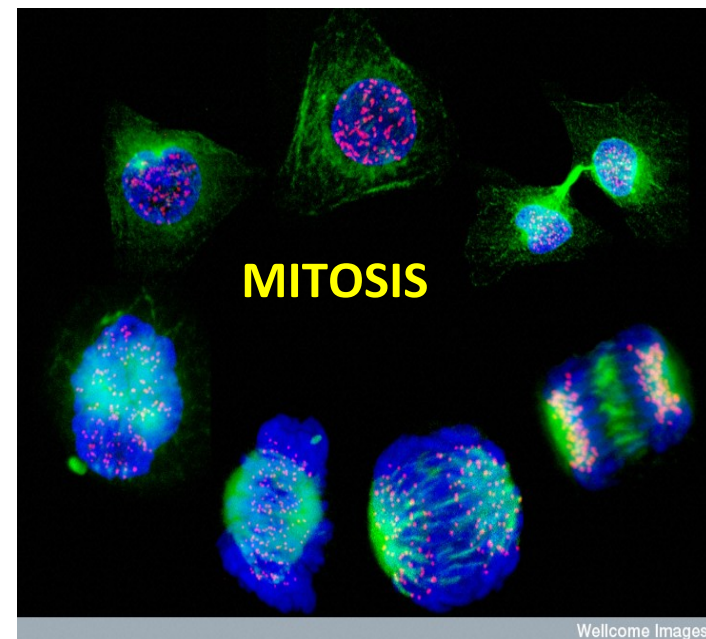
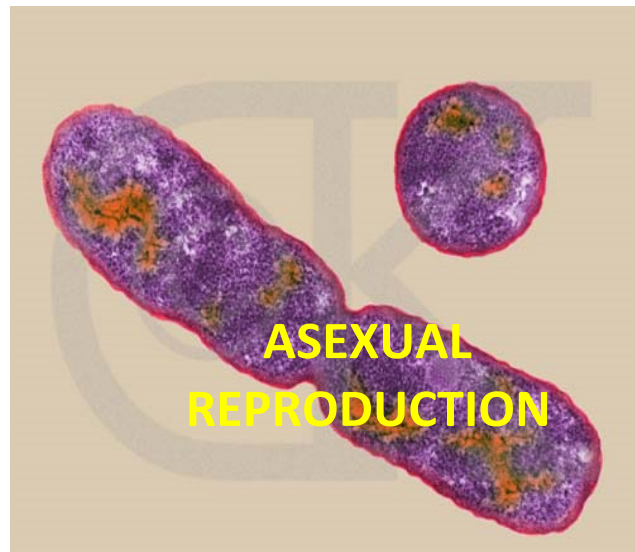
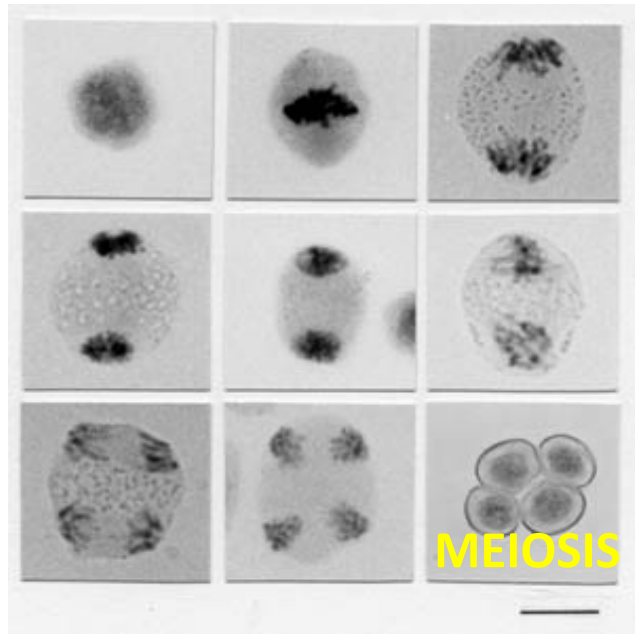
Reproduction

- A cycle has no beginning and no end.
- However, in living organisms, the stages include birth, and later, may include reproduction.
- **Reproduction** is a process that a living organism uses to produce more of its own kind.
- The changes between birth and reproduction varies from one organism to another.



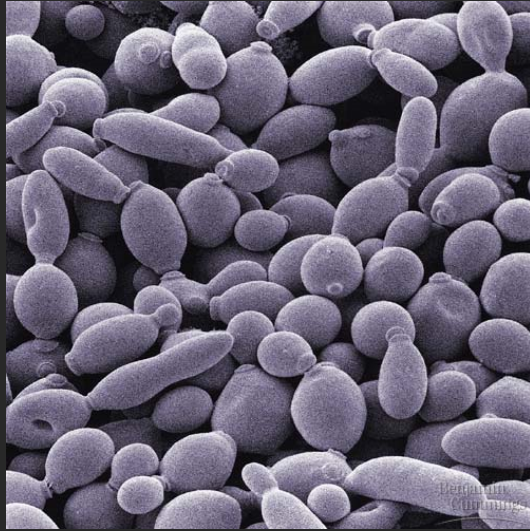
How do Organisms Reproduce?

- All organisms reproduce, but not through the same way.
- Animals reproduce in two basic ways: ***sexually*** and ***asexually***.
- *Asexual reproduction* occurs when one cell divides into two cells, with the same amount and type of information.
- *Sexual reproduction* occurs when a sperm cell from a male and an egg from a female join to make a fertilized egg.



Asexual Reproduction

- Asexual reproduction is much simpler, it doesn't involve a sperm and egg.
- Many invertebrates use asexual reproduction to produce offspring.
- If a piece of a sponge falls off, it can grow into a new adult sponge, this is called **regeneration**.
- Others like anemones and sea corals reproduce asexually by splitting in half.
- Hydras, form a bud (**budding**) that falls off to become a new hydra.



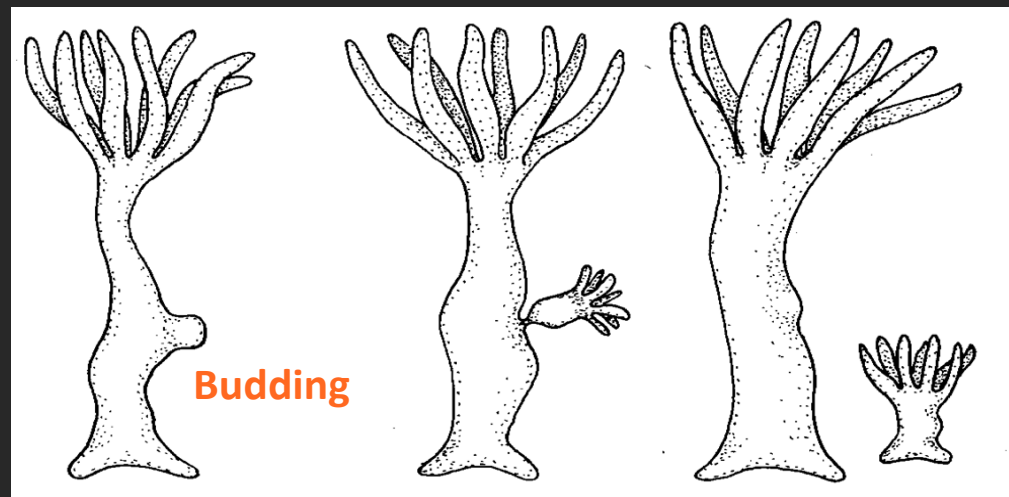
Budding

Paramecium

Yeast

Hydra

Fission



Hydra

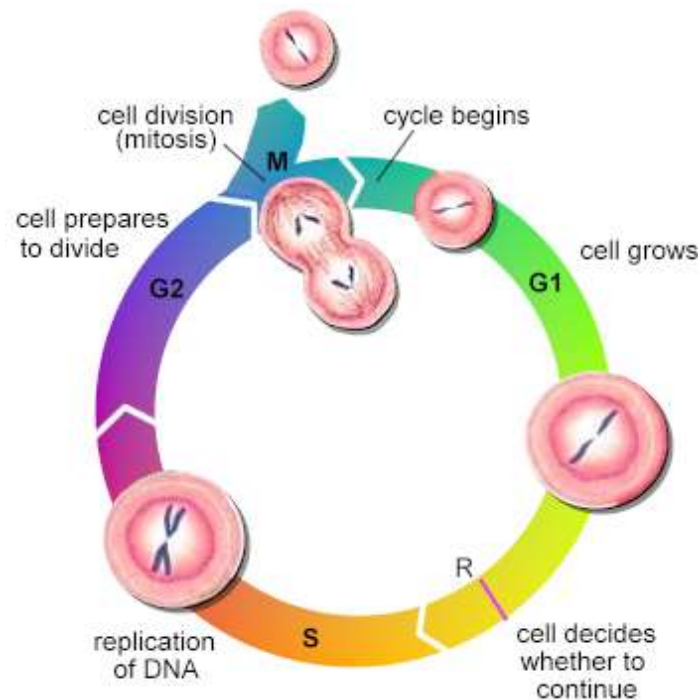


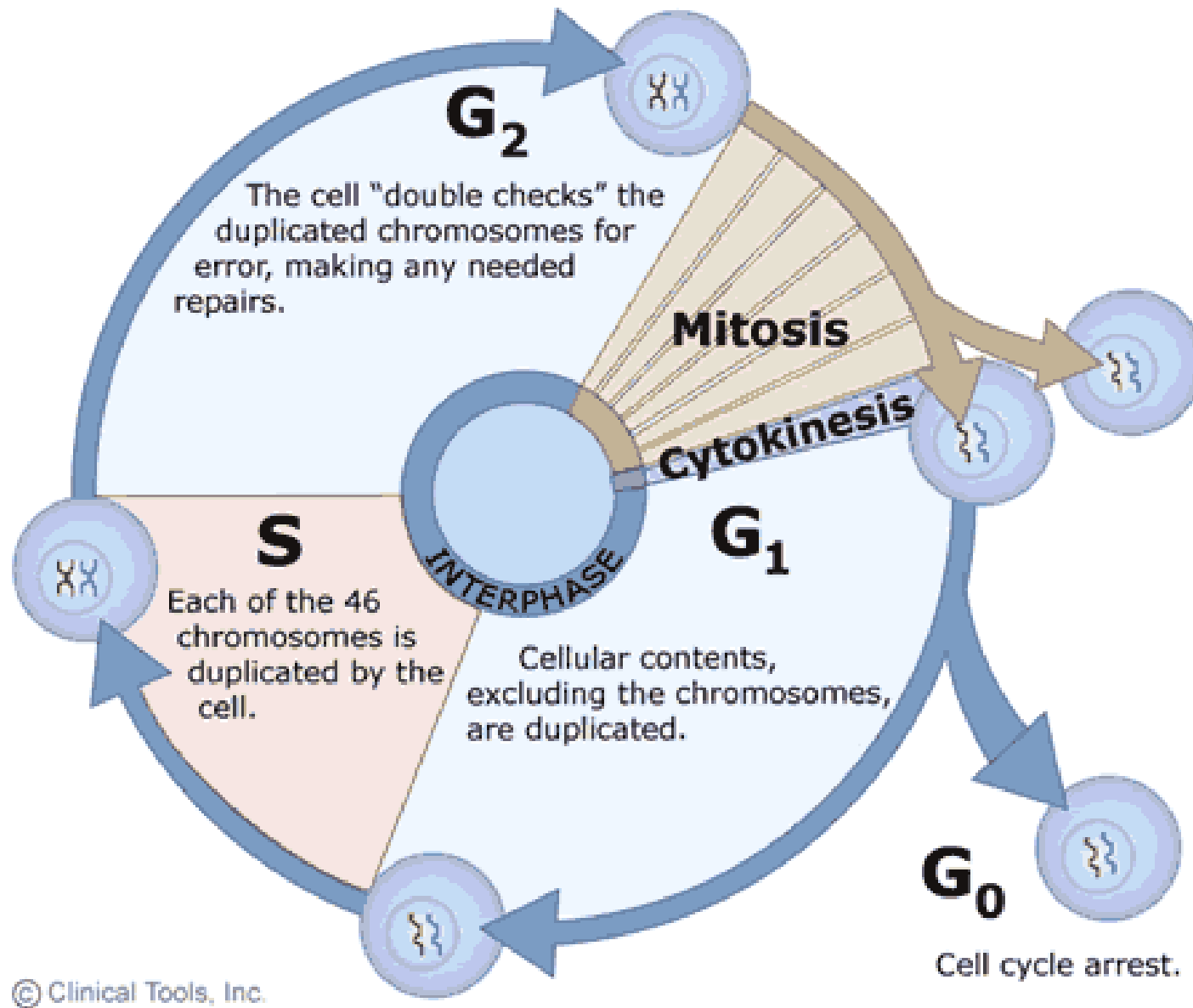
PLANARIAN



Cell Cycle

- Cells also have cycles, different stages happening in a specific sequence and under certain conditions.
- As any other life cycle, it starts by birth (*New cell*), growth (*G1*), preparation (*S*), development and maturation (*G2*) and reproduction (*Cell Division*).





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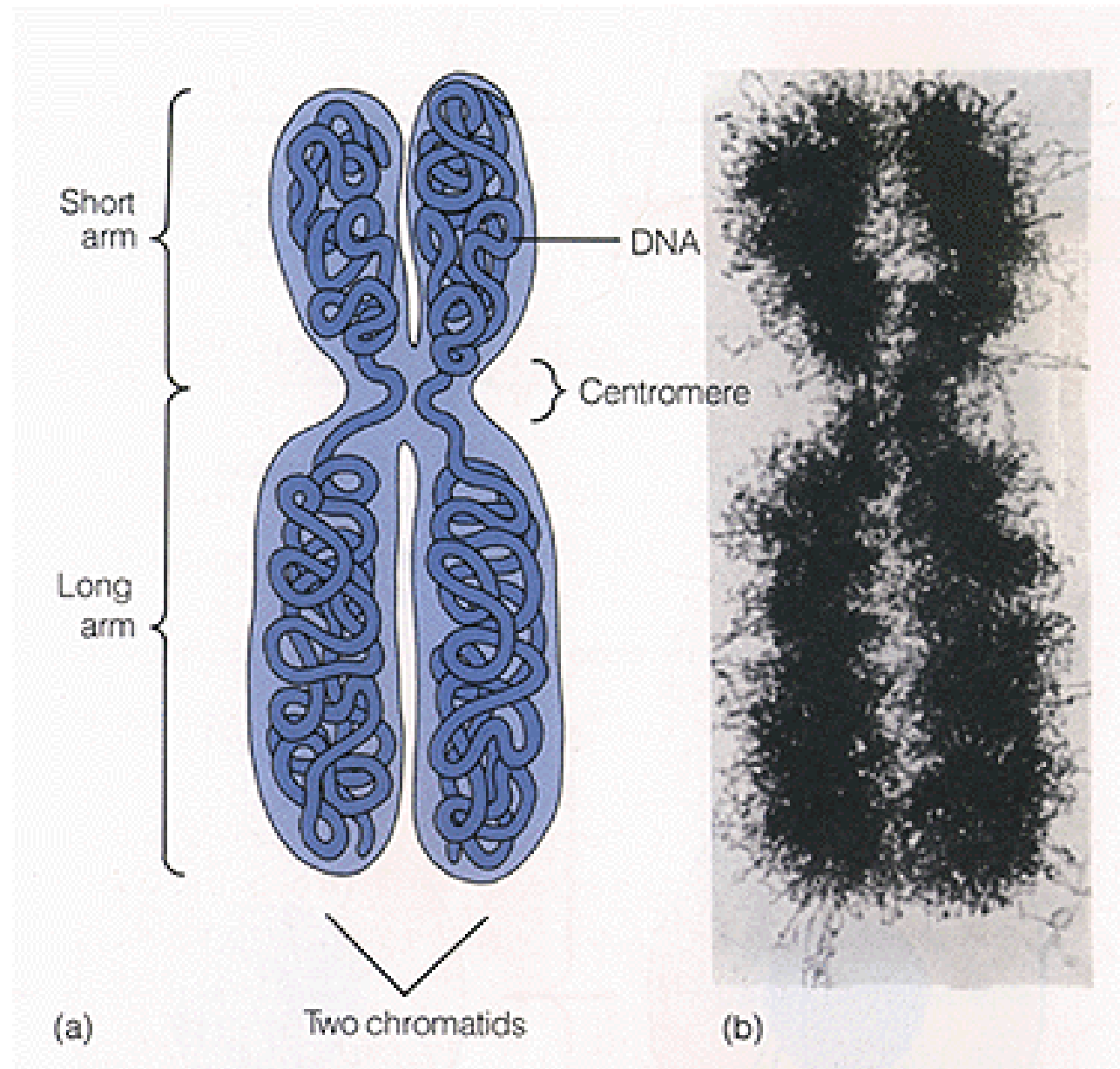


Control of the Cell Cycle
<http://goo.gl/aWbGX>

INTERPHASE

- In the *Interphase*, the cell grows and copies the organelles and chromosomes.
- After each chromosome is duplicated, the two copies are called *chromatids*.
- Chromatids are held together in the center by the *centromere*.
- This first stage has the following parts: G1, S (DNA Synthesis), and G2.

What is a Chromosome?









<http://goo.gl/ttncc>



What is a chromosome?

<http://goo.gl/EQ0gP>

	Organism	Number of chromosomes
	pea plant	14
	sun flower	34
	cat	38
	puffer fish	42
	human	46
	dog	78

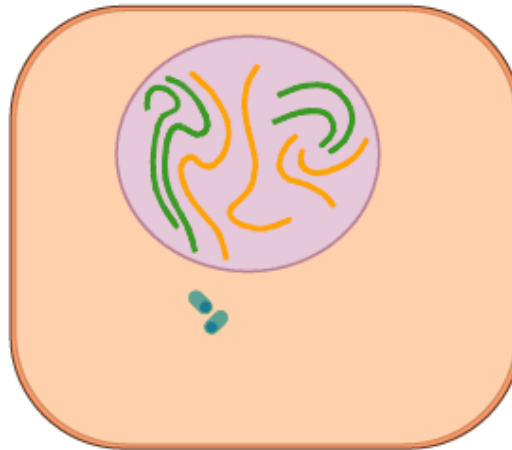


BA2188 [RM] © www.visualphotos.com

<http://goo.gl/cDaho> <http://goo.gl/jNQLT>

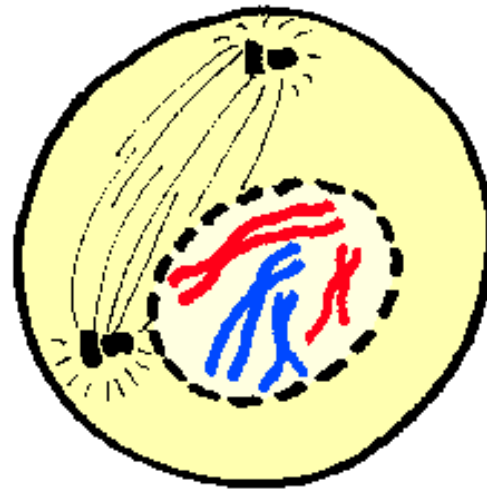
MITOSIS

- All cells use mitosis at one point or another.
- Mitosis is a type of cell division where two cells (daughter cells) are generated from one single cell.
- The daughter cells are identical copies of the original one, with the same genetic information.
- The daughter cells are *clones*.
- Mitosis has 4 stages:
PROPHASE, METAPHASE, ANAPHASE and TELOPHASE.
- These stages are continuous and are regulated by proteins and specific events in and out of the cell.



P R O P H A S E

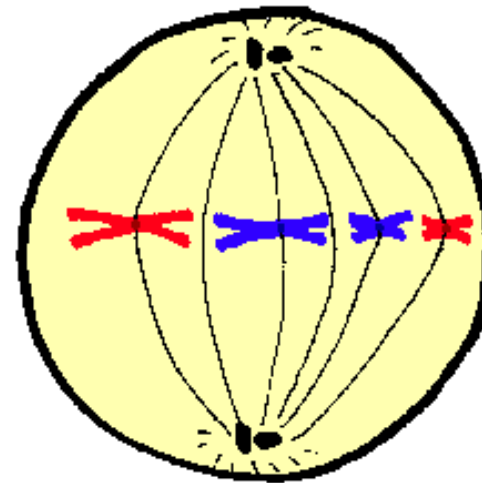
- Mitosis begins.
- Nuclear membrane dissolves.
- Chromosomes condense into rod-like structures.



<http://goo.gl/6WNUT>

M E T A P H A S E

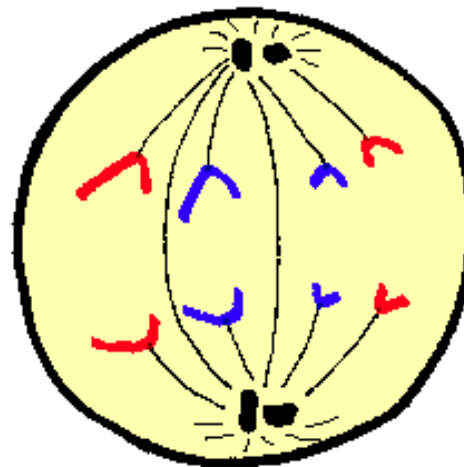
- Chromosomes line up in the cell equator.
- Homologous chromosomes pair up.
- Microtubules from the centrioles continue growing to reach the centromere (center of the chromosome).



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A N A P H A S E

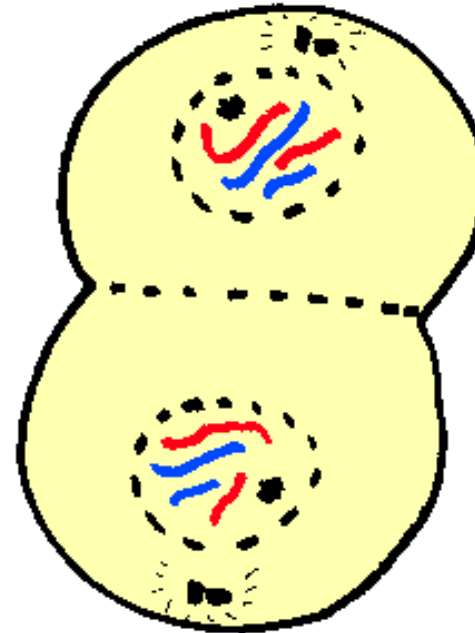
- Microtubules from the centrioles reach the centromere (center of the chromosome) and pull sister chromatids apart.
- Chromatids separate and move to opposite sides of the cell.



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T E L O P H A S E

- Nuclear membrane forms around each set of chromosomes.
- Chromosomes unwind to become chromatin.
- Mitosis is complete.

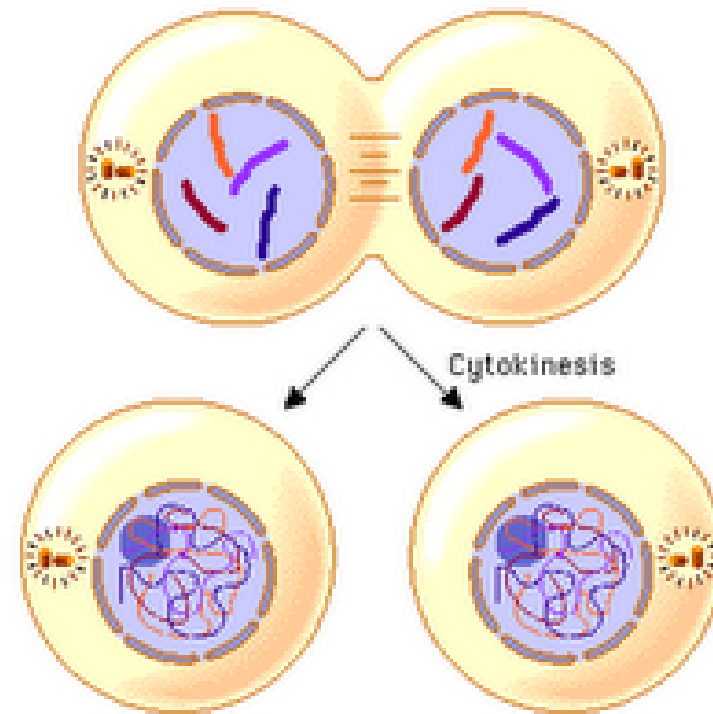


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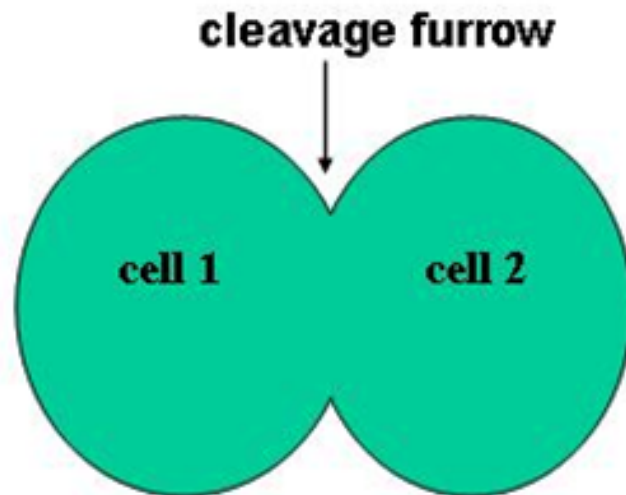
CYTOKINESIS

Is the division of the cytoplasm of a cell.

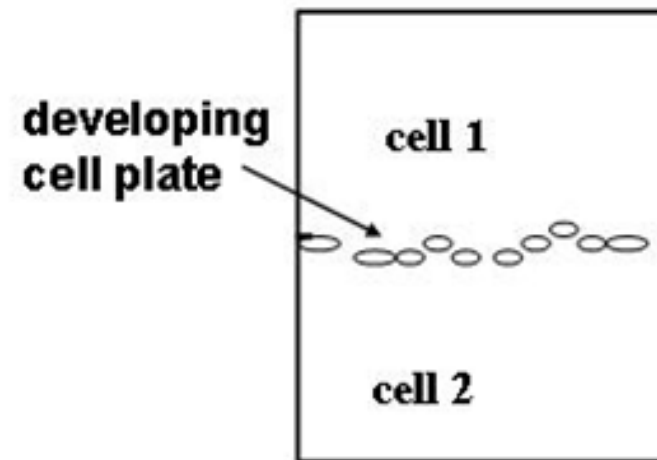
- Cells pinch in two (where there's no cell wall).
- Where there's a cell wall, a *cell plate* forms between the two new cells.



How does Cytokinesis happens?



Animal cells go through cytokinesis by a pinching in of the cell membrane.



Cells with cell walls (plants, fungi, etc.) go through cytokinesis by formation of a cell plate that will become the new cell walls and cell membranes between the two new cells.



Mitosis and Cytokinesis

<http://goo.gl/x19si>

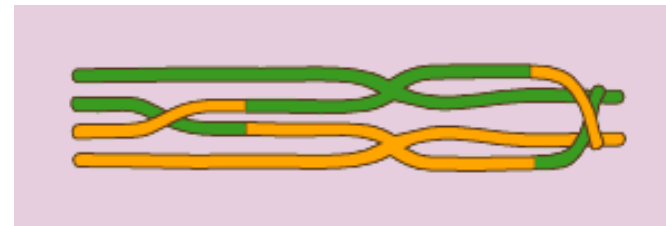
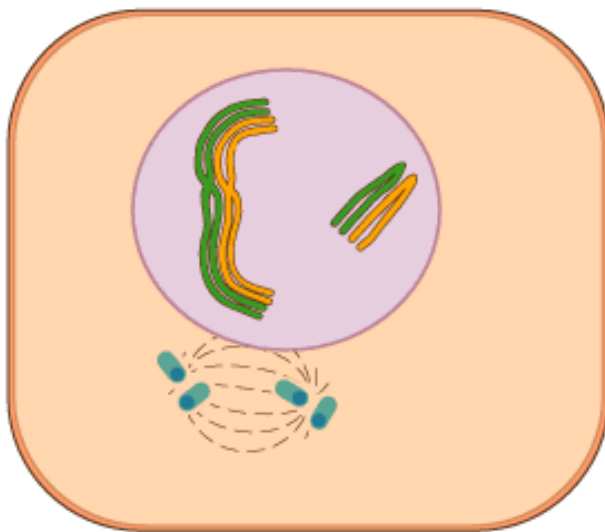


How Cells divide
Mitosis and Meiosis

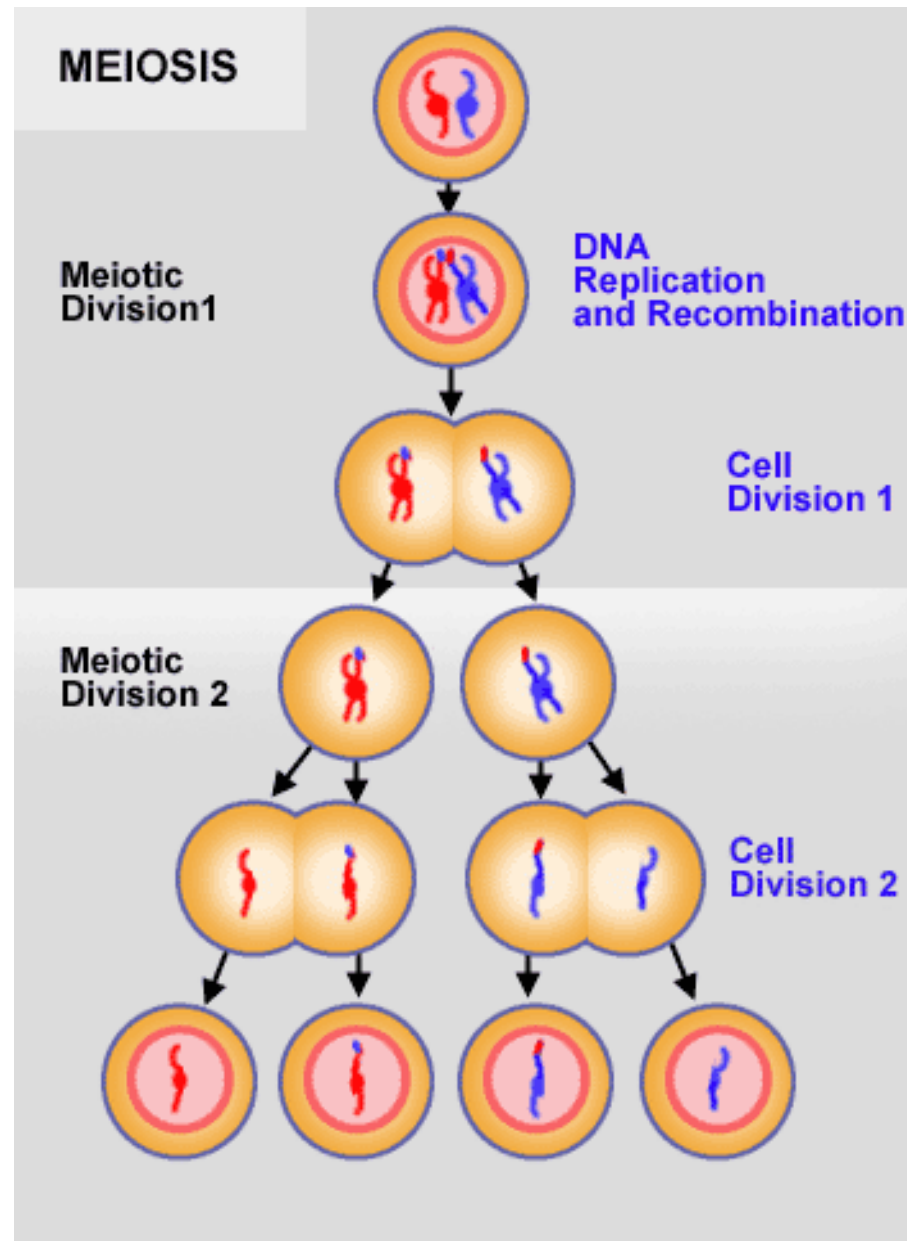
<http://goo.gl/hEI3n>

MEIOSIS

- *Meiosis* is a type of cell division, however, it is used only by organisms that go through Sexual Reproduction.
- Meiosis is a process with 2 divisional stages, each of these stages contain the same sub-stages as in Mitosis: Prophase, Metaphase, Anaphase and Telophase.
- These stages and sub-stages are usually not continuous, but they are sequential.



<http://goo.gl/vZe4U>





Comparison of Meiosis and Mitosis

<http://goo.gl/cySxN>

Objectives

- Understands the life cycle of a cell.
- Describe the phases of the Cell Cycle.
- Understand sexual and asexual reproduction.
- Compare and contrast sexual and asexual reproduction.
- Describe the phases of the cell division process.
- Explain Mitosis.
- Explain Meiosis.
- Compare and contrast Mitosis and Meiosis.

Note: All, or most, of the objectives will be covered during class time, however the student must be responsible for those objectives not covered or concluded.

BACK

Vocabulary

- Chromosome:
- Chromatid:
- Chromatin:
- Homologous:

Note: *Most of the vocabulary words will be covered during class time, however the student must be responsible for those words not covered or concluded.*

BACK

Link and Learn

You can visit the following websites to improve your understanding on the present topic:

- <http://www.cellsalive.com/meiosis.htm>
- <http://www.cellsalive.com/mitosis.htm>
- <http://johnkyrk.com/mitosis.html>
- <http://goo.gl/vZe4U>
- <http://science-altair.wikispaces.com>
- <http://learningandscience.blogspot.com>

BACK

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